



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,609	10/03/2006	Keishi Oohashi	NEC 05P015	1581
27667 7590 06/24/2009 HAYES SOLOWAY P.C. 3450 E. SUNRISE DRIVE, SUITE 140 TUCSON, AZ 85718				
EXAMINER				
AHMED, SELIM U				
ART UNIT		PAPER NUMBER		
2826				
MAIL DATE		DELIVERY MODE		
06/24/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/599,609

**Applicant(s)**

OOHASHI ET AL.

**Examiner**

SELIM AHMED

**Art Unit**

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 27, 29, 31, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 69 and 72-93 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 27, 29, 31, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 69 and 72-93 is/are rejected.
- 7) ☐ Claim(s) 76-79 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Applicant's arguments filed on 02/25/2009 have been fully considered but they are not persuasive. So, rejection of claims 1, 2, 3, 26, 27, 31, 35, 38, 72, 74 has been repeated under this office action. The indicated allowability of claims 29, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 69, 73 in office action sent on 12/24/2009 is withdrawn in view of the newly discovered reference(s).

***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. The drawing lacks following features from claims 76-79:
  - a. Optical coupler
  - b. First optical coupler
  - c. Second optical fiber
  - d. First optical fiber
  - e. Second optical fiber

Therefore, the above features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claim 41 is objected to because of the following informalities:

Claim 41 recites "a scattering member" that has been already introduced in claim 35. The claim 41 should read "the scattering member".  
Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 44, 68, 69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 44, the claim recites the limitation "said second semiconductor layer". There is insufficient antecedent basis for this limitation in the claim. The claim should read "said semiconductor layer" instead. The dependent claim 47 inherits the deficiency.

With regard to claim 68 or 69, the claim recites the limitation "said second semiconductor layer" and "said first semiconductor layer". There are insufficient antecedent basis for these limitations in the claim. Appropriate correction is required. For examination purposes, it was assumed that the claim should recite said semiconductor layer but not said first semiconductor layer and said second semiconductor layer.

With regard to claim 85, the claim recites the limitation "the metal side of the junction" and "the junction". There are insufficient antecedent basis for these

limitation in the claim. The dependent claims 86-88 inherit the deficiency.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 27, 31, 35, 44, 85-89 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujikata et al (US 2003/0185135; Fujikata hereinafter).

With regard to claim 1, Fujikata discloses a photodiode (e.g. Fig. 1) comprising: a conductive film 20 having: an aperture 30 having a diameter smaller than wavelength of incident light (e.g. para[0013, 0014, 0032, claim 15]), and a periodic structure (e.g. Fig. 2A, element 40, para[0044]) provided around said aperture 30 for producing a resonant state (e.g. para[0010, 0044]) by an excited surface plasmon (e.g. para[0010]) in a film surface of said conductive film 20 by means of the incident light to said film surface (para[0044]); and a semiconductor layer 21 (i.e. para[0035], Si or Ge) provided in a vicinity of said aperture 30 of said conductive film 30 and in contact with said conductive film 21; wherein said photodiode detects near-field light (e.g. para[0006, 0008, 0095])

that is generated at an interface between said conductive film 20 and said semiconductor layer 21 by said excited surface plasmon.

The applicant's claim 1 does not distinguish over the Fujikata reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function of detecting near-field light that is generated at an interface between said conductive film and said semiconductor layer by said excited surface plasmon. Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*" [emphasis in original]); *In re King*, 231 USPQ 136 (Fed. Cir. 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed function], challenging the PTO to prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks"); *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (claiming a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable); and *Ex parte Smith*, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007) ("Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art

products do not necessarily or inherently possess the characteristics of his claimed product"). See MPEP § 2114. In this case, it is reasonable to assume that Fujikata's device is capable of detecting near-field light, because a comparison of Applicant's specification to Fujikata's disclosure reveals that Fujikata discloses a device that is apparently identical to the device Applicant describes as being capable of performing the function of detecting near-field light. Because it is reasonable to assume that Fujikata's device is capable of performing the claimed function, the burden shifts to Applicants to show that it is not. See MPEP § 2114.

With regard to claim 2, e.g. para[0030, 0046, 0050] of Fujikata discloses photodiode according to claim 1, wherein said conductive film is a metal film through which said incident light does not pass at locations other than said aperture.

With regard to claim 3, e.g. Fig.1 of Fujikata discloses the photodiode according to claim 1, wherein a region in which a Schottky barrier (metal semiconductor contact) formed by said conductive film 20 and said semiconductor layer 21 substantially matches a region of generation of said near-field light. When the semiconductor compound recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Where the claimed and prior art products are identical



or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of anticipation has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

With regard to claim 27, e.g. Fig. 1 of Fujikata discloses the photodiode according to claim 1, wherein said periodic structure is composed of surface irregularities having a period in a direction of increasing distance from said aperture.

With regard to claim 31, e.g. Figs. 1-6 of Fujikata discloses the photodiode according to claim 1, wherein said periodic structure is composed of concentric grooves that take said aperture 30 as center.

With regard to claim 35, e.g. para[0043] of Fujikata discloses the photodiode according to claim 1, wherein said aperture has a bottom surface 20b portion that is a part of said conductive film 20.

With regard to claim 44, in light of 112, 2<sup>nd</sup> rejection above, para[0043] of Fujikata discloses the photodiode according to claim 1, wherein said aperture 30 penetrates said conductive film 20 and reaches said second semiconductor layer 21, and of said conductive film 20, a periphery around said aperture contacts said second semiconductor layer 21.

With regard to claim 85, Fujikata discloses a photodiode (Fig. 1) comprising: a metal semiconductor junction (21 and upper portion of 20 form a metal semiconductor junction since 21 could be Si or Ge) forming a depletion region in the presence of an applied junction voltage (functional); the junction positioned to receive near field light generated from incident light striking the photodiode from the metal side of the junction through a sub-wavelength aperture 30 due to surface plasmon resonance (functional).

The applicant's claim 85 does not distinguish over the Fujikata's reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function of forming a depletion region in the presence of an applied junction voltage and to receive near field light generated from incident light striking the photodiode from the metal side of the junction through a sub-wavelength aperture due to surface plasmon resonance. Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device is, not what a device *does*" [emphasis in original]); *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed function], challenging the PTO to prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks"); *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977)

(claiming a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable); and *Ex parte* Smith, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007) ("Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product"). See MPEP § 2114. In this case, it is reasonable to assume that Fujikata's device is capable of forming a depletion region in the presence of an applied junction voltage, and to receive near field light generated from incident light striking the photodiode from the metal side of the junction through a sub-wavelength aperture due to surface plasmon resonance, because a comparison of Applicant's specification to Fujikata's disclosure reveals that Fujikata discloses a device that is apparently identical to the device Applicant claims as being capable of performing the above functions used to describe the claim. Because it is reasonable to assume that Fujikata's device is capable of performing the claimed function, the burden shifts to Applicants to show that it is not. See MPEP § 2114.

With regard to claim 86, Fig. 1 of Fujikata discloses the photodiode according to claim 85, wherein the metal side of the metal semiconductor junction comprises a metal film (metal film with surface 20a) through which said incident light does not pass at locations other than said sub-wavelength aperture

30.

With regard to claim 87, e.g. para[0095] of Fujikata discloses the photodiode according to claim 86, wherein said metal semiconductor junction substantially matches a region of generation of said near-field light.

With regard to claim 88, e.g. Fig. 1 of Fujikata discloses the photodiode according to claim 85, wherein said surface plasmon resonance results from a periodic structure (fig. 1) on said metal side of said junction composed of surface irregularities having a period in a direction of increasing distance from said sub-wavelength aperture 30.

With regard to claim 89, an apparatus must be distinguished from the prior art in terms of structure rather than function (i.e. detects near-field light that is generated at an interface between said conductive film and said semiconductor layer by said excited surface plasmon in a depletion region formed at the interface of said conductive film and said semiconductor layer). *In re Schreiber*, 128 F.3d 1473, 1477-78, 44USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also *In re*

*Swinehart*, 439 F.2d 210 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 68, 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata.

With regard to claim 68 or 69, in light of 112, 2<sup>nd</sup> rejection above, Fujikata discloses all of the limitations of the photodiode according to claim 31 or 35 respectively, with the exception wherein a thickness of said semiconductor layer is at least 50 nm but no greater than 100 nm. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the thickness of said semiconductor layer at least 50 nm but no greater than 100 nm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves

only routine skill in the art. In re Aller, 105 USPQ 233. See also In re Peterson, 65 USPQ2d 1379.

7. Claims 35, 41, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view Ueyangi (US 2003/0072245).

With regard to claim 35, Fujikata discloses all of the limitations of claim 1 with the exception of wherein a scattering member composed of a conductive material for scattering light is arranged in said aperture. However, Fig. 1C of Ueyangi discloses a scattering member 12 composed of a conductive material (Au) for scattering light is arranged in said aperture. Para[0050] of Ueyangi discloses that near-field light generated by plasmon excited by the metallic film can be scattered by the metallic light scattering member 12, whereby the utilization efficiency of light can be further improved. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a scattering member composed of a conductive material within Fujikata's device for predictable results.

With regard to claim 41, similar to claim 35 rejection above, it would have been obvious to one having ordinary skill in the art at the time of the invention to include a scattering member composed of conductive material for scattering light, said scattering member being embedded in said semiconductor layer side

extending from an interface between said bottom surface portion and said semiconductor layer corresponding to the position of said aperture for predictable results.

With regard to claim 44, similar to claim 35 rejection above, it would have been obvious to one having ordinary skill in the art at the time of the invention to include a scattering member composed of a conductive material within Fujikata's device for predictable results.

8. Claims 72, 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Scruggs et al (US 2004/0151442; Scruggs hereinafter).

With regard to claim 72 or 90, Fujikata discloses all of the limitations of claim 1 or 89 respectively including an optical module Fig. 9 comprising: a photodiode 10 according to claim 1 for detecting signal light emitted from an optical fiber 100 to supply it as an electrical signal; but does not disclose a preamplifier for amplifying the electrical signal. However, in Fig.1, element 107 of Scruggs discloses an optical module 100 comprising a preamplifier 107. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a preamplifier as suggested by Scruggs for amplifying electrical signal.

9. Claims 74, 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Scruggs et al (US 2004/0151442) and further in view of Ojima et al (US 6334716; Ojima hereinafter).

With regard to claim 74 or 91, Fujikata in view of Scruggs disclose all of the limitation of claim 72 or 91 respectively with the exception of the optical module comprising: a case; and an optical coupler for optically coupling said optical fiber and said photodiode; wherein said photodiode and said preamplifier are accommodated in said case. However, in Fig. 10, Ojima et al discloses an optical module 10 comprising: a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30 with Fujikata's optical module for predictable results i.e. a complete optical module.

10. Claims 29, 80, 50, 53, 56, 59, 62, 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Applicant Admitted Prior Art (APA).



With regard to claim 29, Fujikata discloses the limitations of claim 1 as discussed above and Fujikata further discloses said conductive film 20 has a first surface 20a and a second surface (surface of 20 that is in direct contact with upper surface of 21) said aperture 30 is formed from said first surface side (Fig. 1); and said periodic structure is composed of surface irregularities (Figs. 1, 3A) having a period (P) in a direction of increasing distance (Figs. 1, 3A) from said aperture 30.

However, APA discloses said semiconductor layer 61 is a first semiconductor layer 61 of one conductive type (i.e. n-type) and in contact with the second surface of said conductive film (replacing 21 of Fujikata with 61 meet this limitation) ; and said photodiode further includes a second semiconductor layer 60 of said one conductive type (i.e. n-type) in which the concentration of impurities (i.e. n+) is higher than (i.e. n-) in said first semiconductor layer 61, and which contacts a surface of said first semiconductor layer 61 that is opposite to another surface in contact with the second surface of said conductive film. In another words, Fujikata's semiconductor layer 21 has been substituted with APA's first and second semiconductor layers (61 and 60) that form the Schottky photodiode with metal film 66. In para[006] of APA discloses that Schottky photodiodes are sometimes used to improve the response speed by shortening the carrier transit time. It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute Fujikata's semiconductor layer 21

with APA's first semiconductor layer 61 and second semiconductor layer 60 for predictable results.

With regard to claim 80, since claim 80 is same as claim 29, rejection of claim 29 is applicable.

With regard to claim 50, e.g. Fig. 2 of APA discloses the photodiode according to claim 29, wherein a transparent film 66 having an index of refraction substantially equal to that of said semiconductor layer is provided on said first surface of said conductive film.

With regard to claim 53, e.g. Fig. 2 of APA discloses the photodiode according to claim 50, further comprising an antireflection film 68 for incident light provided on said transparent film 66.

With regard to claim 56, e.g. para[0045] of Fujikata discloses the photodiode according to claim 29, wherein said conductive film is a metal film and the diameter of said aperture is at least  $1/10$  but no greater than  $1/2$  the wavelength of said incident light. Moreover, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the diameter of said aperture no greater than  $1/2$  the wavelength of said incident light through routine experiment based on design needs and criteria. It has been held

that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. See also In re Peterson, 65 USPQ2d 1379.

With regard to claim 59, e.g. para[0032] of Fujikata discloses the photodiode according to claim 56, wherein the period of said periodic structure is equal to or less than the wavelength of said incident light.

With regard to claim 62, e.g. para[0010, 0062] of Fujikata discloses the photodiode according to claim 56, wherein the period of said periodic structure is set to a resonant wavelength of the surface plasmon excited on said conductive film 20 by said incident light.

With regard to claim 65, e.g. para[0051] of Fujikata discloses the photodiode according to claim 56, wherein said metal film has a thickness no greater than 1000 nm but at least 100 nm (200 nm of Ag) at concave portions of said periodic structure. Fujikata is silent about a depth of said surface irregularities is at least 20 nm but no greater than 200 nm. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the thickness of the metal film and depth of the surface irregularities, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves

only routine skill in the art. In re Aller, 105 USPQ 233. See also In re Peterson, 65 USPQ2d 1379.

11. Claim 73 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Applicant Admitted Prior Art (APA) and further in view of Scruggs.

With regard to claim 73, Fujikata in view of APA discloses all of the limitations including a photodiode according to claim 29 for detecting signal light emitted from an optical fiber 100 to supply it as an electrical signal; with the exception of a preamplifier for amplifying the electrical signal. However, in Fig.1, element 107 of Scruggs discloses an optical module 100 comprising a preamplifier 107. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a preamplifier as suggested by Scruggs for amplifying electrical signal.

12. Claim 75 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Applicant Admitted Prior Art (APA) and further in view of Scruggs and further in view of Ojima.

With regard to claim 75, Fujikata in view of APA and further in view of Scruggs discloses all of the limitations of claim 73 with the exception of the optical module according to claim 73, comprising: a case; and an optical coupler

for optically coupling said optical fiber and said photodiode; wherein said photodiode and said preamplifier are accommodated in said case. However, in Fig. 10, Ojima et al discloses an optical module 10 comprising: a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30 with Fujikata's (in view of APA and Scruggs) optical module for predictable results i.e. a complete optical module.

13. Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of APA and further in view of Scruggs.

With regard to claim 81, Fujikata in view of APA discloses all of the limitations of claim 80 including an optical module Fig. 9 comprising: a photodiode 10 according to claim 1 for detecting signal light emitted from an optical fiber 100 to supply it as an electrical signal; but does not disclose a preamplifier for amplifying the electrical signal. However, in Fig.1, element 107 of Scruggs discloses an optical module 100 comprising a preamplifier 107. It would have been obvious to one having ordinary skill in the art at the time of the

invention to include a preamplifier as suggested by Scruggs for amplifying electrical signal.

14. Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of APA in view of Scruggs and further in view of Ojima.

With regard to claim 82, Fujikata (in view of APA, Scruggs) disclose all of the limitation of claim 81 with the exception of the optical module comprising: a case; and an optical coupler for optically coupling said optical fiber and said photodiode; wherein said photodiode and said preamplifier are accommodated in said case. However, in Fig. 10, Ojima et al discloses an optical module 10 comprising: a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30 with Fujikata's optical module for predictable results i.e. a complete optical module.

***Response to Arguments***

15. Applicant's arguments filed 02/25/2009 have been fully considered but they are not persuasive.

On page 5 of the remark applicant argued, "The Examiner's rejection of claims 1, 2, 3, 26, 27, 31 and 35 under 35 U.S.C. § 102 (b) over Fujikata is improper since Fujikata does not even disclose one of the operative elements of the claims, namely, a photodiode. Fujikata discloses an optical device and an optical head using it. The layers of conductive film 20 enclosing the intermediate layer 21 of Fujikata do not form a diode at all. There is no disclosure of the application of a junction voltage across the layers of Fujikata nor forming such a junction in the vicinity of the hole 30 in the layers 20, 21 of Fujikata".

However, applicant's claimed "photodiode" and Fujikata's structure (Fig. 1) are identical. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of anticipation has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). Since Fujikata's structure contains every claimed element i.e. "photodiode", it is reasonable to assume that Fujikata's device is same as applicant's "photodiode". Furthermore, applicant's claimed elements do not form a diode either. Applicant argument directed to forming a diode, which was not claimed.

***Allowable Subject Matter***

16. Claims 76-79, 82, 84, 92 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With regard to claim 76, 77, 83, 92, the prior art of records fail to teach or suggest an optical interconnect module with particularly a photodiode for receiving incidence of light emitted from a first optical fiber to generate a first signal current; a light source for generating a signal light that is irradiated into a second optical fiber; and a mounting board on which said photodiode and said light source are arranged; wherein said first signal current is supplied to an LSI, and said light source generates the signal light in accordance with the second signal current from said LSI as in the combination of claim 76 or 77 or 83 or 92 with the base claim.



### **Conclusion**

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SELIM AHMED whose telephone number is (571)270-5025. The examiner can normally be reached on 9:00 AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571)272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SA

/Sue A. Purvis/  
Supervisory Patent Examiner, Art Unit 2826